Consumers' Knowledge about their Health Insurance Coverage

by M. Susan Marquis

This paper describes how much families know about their health insurance coverage and investigates whether consumer education and simplified benefit structures would improve knowledge. Families' perceptions about their insurance benefits were measured in two household surveys administered in six sites. Knowledge was assessed by comparing families' responses with policy data collected from the carrier.

The vast majority of families understand insurance policies that specify one or two parameters in their benefit provisions. However, more complex payment structures are not well understood. Increased exposure to information in the plans leads to increased knowledge which suggests that education programs could improve the general level of knowledge. We conclude that if market strategies for allocating medical resources are pursued, simplifying insurance benefit structures and educating consumers about their insurance benefits would aid consumers in making more informed economic choices about medical care.

Introduction

Some health policy recommendations rest on assumptions about consumers' knowledge of the health care system. Advocates for greater reliance on market competition for allocating medical care resources (Eliwood, 1978; Enthoven, 1978; National Commission on the Cost of Medical Care, 1978) assume that consumers are (or can be) sufficiently well informed to make market processes work well. Regulatory advocates, on the other hand, assume consumers cannot acquire sufficient knowledge to make optimum decisions.

Given its importance, surprisingly little measurement of consumer knowledge has been undertaken. Newhouse, Ware, and Donald (1981) show that most consumers have some basic understanding about the medical care delivery system, but many lack knowledge about certain facts that are relevant to decisions about medical care use. In this paper, we examine another aspect of consumers' knowledge of the health care system—their knowledge about their health insurance coverage.

Health insurance affects the money price that families pay for care; if consumers do not understand their insurance benefits, their decisions about medical care use may be based on incorrect estimates of the prices they would pay. Further, if families do not understand their present policies, they may be purchasing more or less insurance than is optimal.

This work was supported by Health Care Financing Administration grant 18-P-97122/9-03. Reprint requests: M. Susan Marquis, Rand, Washington Office, 2100 M Street, N.W., Washington, D.C. 20037.

Little is known about consumers' knowledge of their insurance policies. Studies of the factors affecting consumers' choices between a prepaid group practice and other insurance programs have found that the reasons given for the choice accurately reflect differences between the programs (Tessler and Mechanic, 1975; Scitovsky, McCall and Benham, 1978). On the other hand, some studies have found gaps in consumers' knowledge about the kind of insurance coverage they have (National Center for Health Statistics, 1966; Andersen, Kasper, Frankel, 1979). But all of these studies leave many unanswered questions about how much consumers know about their benefits.

Our purpose in this paper is twofold. We look at how accurately families can describe the extent of their benefits for a number of medical services, and we examine reasons for variation across families in such knowledge.

Under most health insurance contracts, families are reimbursed for part of their medical expenditures. These reimbursement insurance contracts frequently include deductibles (fixed amounts that the family must spend before the insurance policy pays any benefits), coinsurance (a percentage of the bill that the family pays), internal limits (for example, limits on the number of doctor visits or hospital days allowed), or fee-schedule limits (for example, limits on the per visit charge for doctor visits). An alternative to reimbursement insurance is prepaid health care. Families who belong to a prepaid health group pay a fixed periodic fee in advance and receive specified health services from physicians participating in the group. We examine and compare knowledge of benefits among families with reimbursement insurance and among those in a prepaid group.

In addition, we investigate the factors affecting consumers' knowledge about their health insurance coverage to see if there are ways that their knowledge can be improved. In particular, we are interested in whether simplified benefit structures and consumer education would lead to improved consumer knowledge.

We find that gaps do exist in current knowledge, especially about coverage of outpatient services. Knowledge is greater when benefits are simple. Prepaid group practice plans and reimbursement policies with only a few parameters are more accurately understood than complex policies. We also find evidence suggesting that consumer education could be effective.

This paper contains six sections. The second section (Methods) describes the consumer sample, the data collection documents, and the basic methods of analysis. In sections three, four, and five, we address three questions about consumers' knowledge: Do families know whether or not they have health insurance? Do families know what services are covered by their insurance? Do families know what benefits the plan will pay for covered services? The final section provides a summary of the results and conclusions.

Methods

Sample

The sample for this study includes 3,218 families in six sites. The sites are: 1) the Dayton, Ohio, Standard Metropolitan Statistical Area; 2) the urbanized portion of the Seattle, Washington, Standard Metropolitan Statistical Area; 3) the Fitchburg-Leominster, Massachusetts, Standard Metropolitan Statistical Area; 4) the Charleston, South Carolina, Standard Metropolitan Statistical Area; 5) most of Franklin County, Massachusetts; 6) most of Georgetown County, South Carolina.

Part of the sample in each site is families who participated in the experimental phase of the Health Insurance Study (HIS), a social experiment in health care financing. Participants in the study were randomly assigned to one of 14 experimental health insurance plans that differed in the amounts they reimbursed families for medical expenditures. In addition, a portion of the Seattle, Washington sample were enrolled in Group Health Cooperative of Puget Sound, a well-established prepaid group practice.[1]

The other part of the sample in each site is a comparable group of families who did not participate in the experimental insurance plans, but held their own health insurance coverage. This part of the sample we term control families. Some of the control families in Seattle, Washington were enrolled in the Group Health Cooperative. The numbers of experimental and control families in each geographic area are shown in Table 1.

Sample families are representative of families in each area, with certain exceptions: 1) Families with incomes less than one and one-half times the poverty line are slightly oversampled; 2) families headed by persons who were 62 years of age or older at the time of enrollment are excluded; 3) also excluded are veterans with service connected disabilities, active duty military personnel and their dependents, military retirees with access to military medical care facilities, individuals eligible for either the Medicare program or the Supplemental Security Income program (recipients of Aid to Families with Dependent Children, however, are included), and families with incomes of $25,000 (1973 dollars) per year or more.

TABLE 1

Numbers of Families in the Study Sample by Site

Site	Numbers of Families	
	Experimental Families	Control Families
Dayton, Ohio	404	100
Seattle, Washington		
Reimbursement Insurance	491	111
Group Health Cooperative	420	289
Fitchburg/Franklin Co., Mass.	554	200
Charlestown/Georgetown Co., S. Carolina	548[1]	414[1]

[1]There were 313 families in the control group in South Carolina who were subsequently enrolled in the experiment. These families initially received questionnaires to measure their knowledge about their existing insurance coverage. Later they were given questionnaires to measure their knowledge about the experimental plans. Thus, these families are included in both the control group sample and the experimental sample.

Data Collection Design

Consumer Questionnaires

Measures of families' knowledge about their insurance coverage were collected in two interviews. The first interview measured families' knowledge about whether they were insured and the services covered by their insurance. The second interview was designed to measure knowledge about the amount of benefits the insurance pays for a variety of services.

The first interview, called the baseline interview, was done in person with heads of families. The interview was conducted with all the sample families prior to the experimental phase of the study. The questions in the baseline interview asked families whether they had private health insurance coverage, the source of each health insurance policy, and whether each policy provided specified services.[2] The questions about covered services were experimentally varied to test the effect of a more detailed questioning method on estimates of a family's knowledge. We will say more about this variation in section four.

The second interview was a self-administered questionnaire designed to elicit information about the families'

[1]The study is described in Newhouse, 1974.

[2]The baseline interview in Dayton, Ohio did not include questions about services covered.

knowledge of the benefits their insurance would pay for specified services. Experimental families received the second questionnaire after they had enrolled in the experimental insurance plans, and were asked to answer questions about their new experimental coverage. Control families also received the second questionnaire, and their answers related to the insurance coverage they then held. Questions were designed to measure consumers' understanding of their insurance benefits for first-dollar expenditures on each of five services. These questions asked respondents how much they would pay for a hypothetical hospital room and board charge, a visit to a physician's office, a prescription drug charge, an initial psychiatric evaluation, and a dental bill for cleaning. Questions were also designed to measure their knowledge of coverage for large medical bills. These questions asked respondents how much of the five hypothetical medical expenditures they would pay if they had previously incurred a $4,000 hospital bill.

Ninety-one percent of the experimental families and 79 percent of the control families returned the self-administered questionnaire.

Insurance Verification

Contacts were made with insurance carriers or employers to verify that coverage reported by families was in effect and to obtain detailed information about the benefits of the plans.

We attempted to verify the baseline insurance coverage for 2,280 families in Seattle, Massachusetts, and South Carolina. Budgetary limitations prevented us from a complete verification effort. We did not attempt to verify coverage of the Dayton sample because the baseline questions asked of Dayton families differed from those asked in the other sites.

Each employer or carrier named by families in the baseline verification sample was provided with a self-administered insurance verification questionnaire. In addition, questionnaires were given to employers of all family members to see if the family had insurance that was not reported during the interview. The employer or carrier was asked to verify that the insurance was in effect and to provide brochures or pamphlets that described the benefits of the plan in detail.

We were able to obtain brochures describing the insurance, or to verify that the family was uninsured, for 1,481 families (65 percent of attempts). The usual reason for failure to verify insurance was the employer's failure to return the requested brochure. Because the employer's failure to respond is probably not related to participants' knowledge, the results probably have not been seriously biased.

We verified the insurance coverage in force for the control families by conducting telephone interviews with employers or carriers. Brochures describing benefits of the plan were requested. In addition to verifying private insurance policies reported by the family, Medicare or Medicaid coverage was verified for this phase of the project. We did not, however, make efforts to find other policies not mentioned by the respondent during this phase of data collection. Brochures were obtained for 82 percent of control families reporting insurance coverage at the time of the second survey.

Insurance Abstraction

Details of the coverage outlined in policy brochures obtained from the carriers and employers were abstracted by study staff onto a uniform insurance abstraction coding form. The form indicated what services were covered by the plan and contained enough information to determine what the plan would pay for any medical service use.

Method of Analysis

Measuring Consumer Knowledge

Family knowledge was measured by comparing the responses given in the two questionnaires with the information we abstracted onto the insurance coding form. For each question, a family was given a zero or one value denoting an "incorrect" and "correct" response, respectively. Responses of "don't know" were scored as incorrect.

Baseline questions about covered services were asked about each policy. For analysis, we aggregated across all policies for families who had more than one. For example, if a family reported that any policy provided coverage for hospital care, the question was scored as having been correctly answered if the insurance records also indicated that hospital coverage was provided by any of the family's policies. For 9 percent of the verified sample, we were not able to obtain details of all the insurance policies that the family held at the time of baseline. These families are included in the analysis by examining only the answers they gave about the verified insurance.[3]

Families' answers to the mailed questionnaire were scored as correct if they were within a specified tolerance range of the true response. An answer was considered correct if the share of the bill that the family reported it would itself pay was within 10 percentage points of the true share. For the hypothetical physician, dental, and prescription drug bills, this allowed an error of less than $1 and we avoided scoring answers as incorrect if the family rounded to the nearest dollar. For the hypothetical hospital and psychiatric bills, the deviation permitted errors of less than $10. Results were not qualitatively different if an exact answer was required.

The questionnaires for participants in the Group Health Cooperative did not specify a dollar amount of medical bills because there is no charge at the time of service. To achieve comparability in scoring, we scored families in the Group Health Cooperative as having given a correct answer if their reported hospital and initial psychiatric bills were less than $10, and if their physician and drug responses were less than $1. The control families enrolled with Group Health Cooperative are required to make a copayment for psychiatric visits after the 10th visit. The co-

[3]Analyses were also performed excluding these families; the results did not differ from those to be reported.

payment ranges from $5 to $8. Group Health control families' answers about how much they would pay for the repeat psychiatric visit (the 21st) were scored as correct if the responses were within $10 of the true copayment.[4]

Adjusted Knowledge Scores

One of the questions we want to address is whether knowledge scores, that is, the percentage of families giving the correct answer, vary according to the type of insurance coverage. In making these comparisons, we want to control for differences between comparison groups in other family characteristics that may affect knowledge. Our procedure is to use linear regression to fit a linear probability function explaining the probability that a family gives a correct answer. We then present knowledge scores, or the percentage of families responding correctly, that are adjusted for differences in other characteristics among families with different types of insurance. Formally, we fit the following model:

$$Y = \delta_j P_j + \beta X + e,$$

where, Y = 0,1 variable indicating whether the family's response is correct,

P_j = indicator variables for the type of insurance plan,

X = vector of other family characteristics,

e = error term,

δ_j, β = parameters to be estimated.

An example of the "type of insurance plan" indicator variables, represented by P_j, is: P_1 is 1 if the plan pays for the service in full; P_2 is 1 if the plan pays a part share for the service; P_3 is 1 if the plan pays nothing for the service.

The variables in the vector of other characteristics, X, are measured as the family's deviation from the mean value of the variable for the entire study sample. Thus, the coefficients on the P_j indicator variables reflect the probabilities of giving a correct answer for a typical family, one with average characteristics. The coefficient δ_j we call the adjusted knowledge score for families with insurance plan type j.

Definitions of the variables included in the vector of characteristics, X, and their mean values for the entire study sample of 3,218 families are shown in Table 2. Education, race, income, and prior use of health services were collected from families in the baseline interview. The other measures were obtained from employers and carriers as part of insurance verification.

[4]About one-half of the Group Health control families receiving a correct score for the repeat psychiatric visit answered that they would pay for nothing; the other one-half of the families receiving a correct score recognized that they would have a small copayment.

TABLE 2

Definitions and Means of Variables Used in Regression

Variable	Definition	Mean
Ed. Head	Education of the family head	12.45
Prior Use for:		
Hospital	Dummy = 1 if any family member hospitalized past year	.25
Physician	Ln (Family Physician Expenses past year + 1)	4.88
Drug	Ln (Family Drug Expenses past year + 1)	3.46
Dental	Ln (Family Dental Expenses past year + 1)	3.50
Choice	Dummy = 1 if Employer Group Offers Choice of Plans or if Privately Purchased Insurance	.29[2]
Covered 2-5	Held Coverage 2 to 5 years	[3]
Covered 5+	Coverage 5+ years	[4]
Race	Dummy = 1 if Minority	.13
Ln Income	Ln (Family Income)	9.4

[1]Means are for total study sample except as noted.
[2]Mean for families with verified baseline coverage.
[3]Medical coverage = .26; dental coverage = .09. Mean for control families with verified post-enrollment coverage.
[4]Medical coverage = .49; not applicable for dental coverage. Mean for control families with verified post-enrollment coverage.

We will be examining knowledge scores for three analysis subgroups—1,481 families with verified baseline insurance coverage, 774 control families with verified post-enrollment coverage, and 2,230 experimental families who completed the post-enrollment questionnaire. Each analysis group includes only some of the 3,218 families in the total sample because of questionnaire and verification nonresponse, because we attempted to verify baseline coverage for only a part of the total sample, and because of the experimental treatment variation.

Characteristics for each analysis group differ slightly from the overall averages shown in Table 2. In particular, families with verified baseline insurance coverage have lower incomes and lower health expenditures than average, whereas control families with verified post-enrollment coverage have higher incomes and higher health expenditures than average. However, the differences between the subsamples are small and arise primarily because of differences between the analysis groups in the percentage of families living in each geographic area and because sites differ in the distribution of characteristics. The adjusted knowledge scores we present control for the differences between the analysis groups.

Knowledge of Whether Insured

Our first question is "Do families know whether they have health insurance coverage?" To answer this question, we compared their answers in the baseline interview with the information collected from employers and carriers.

About one-third of the families who reported that they were uninsured were found to have had insurance at the time of the baseline interview, whereas only 3 percent of those who said they were covered turned out not to be, according to records (Table 3).[5] This results in a small net survey underreporting of being uninsured. For the most part, however, families were accurate in reporting whether or not they were insured. More than 90 percent of families answered correctly.

TABLE 3

Cross-Classification of Survey and Verification Reports of Health Insurance

	Percent of cases		
	Have coverage	Do not have coverage	Total
Have coverage	80	2	82
Do not have coverage	6	12	18
Total	86	14	100

N = 1,481 families for whom verification reports were available.
Note: Observations are weighted to correct for a higher verification completion rate for families reporting being uninsured than for families reporting having insurance.

Knowledge of Services Covered by Insurance

Do families know the specific services for which they are insured? We found families were accurate in reporting their hospital care coverage but were less knowledgeable about their coverage for outpatient services. Lack of knowledge that outpatient services are covered is more likely among families whose policy includes a deductible than among families whose policies pay benefits for the first dollar expended.

Baseline Measures of Knowledge of Services Covered

Here we compare baseline interview answers with information coded from the policy brochures to examine whether families were able to accurately report the services covered by their insurance. Families who reported having private insurance at the baseline interview were asked whether the policy provided benefits for each of four services: hospitalization, outpatient physician visits, outpatient prescription drugs, and dental care. The percentages of families reporting that their policy covered each service are compared with the corresponding percentages obtained from insurance records (Table 4). The comparisons are for families who reported being insured and whose insurance coverage was verified by the carrier or employer. Families who were accurate in reporting that they were insured were also accurate in reporting that their insurance

[5]The report of having insurance refers to private health insurance; families with Medicare, Medicaid, and other welfare insurance programs are considered to be uninsured unless they also are covered by a private insurance policy.

TABLE 4

Percent of Insured Families Reported as Covered for Various Services, Baseline Results

	Source of Information	
Service	Survey	Record
Hospital	99	100
Outpatient Physician	70	92
Outpatient Drug	55	95
Dental	26	22

Sample size: 1,099 families with reported and verified insurance.

covers hospital care, the service most commonly covered by insurance.[6] These families, however, substantially underreported their outpatient physician and drug coverage. Dental coverage was slightly overreported. These results are similar to the findings of previous studies.[7]

Are there features in some insurance policies that contribute to families' lack of knowledge of their coverage for outpatient medical services? To investigate this, we assigned families a score of one if they correctly reported whether the service was covered, and a score of zero if not. We then regressed these scores on indicator variables for the type of coverage the family had for the service: the prepaid group practice (GHC); reimbursement insurance providing first dollar benefits for the service; reimbursement insurance requiring an initial deductible; or the service is not covered by the policy. Other variables in the regression include education and race of the family head, family income, and the families' use of health services. Table 5 shows the regression coefficients (multiplied by 100) for the type of coverage indicators. Coefficients for the other variables are given in Table 6.

The regression coefficients in Table 5 represent the percentage of families, with each type of coverage, who gave a correct answer, after adjusting for differences in demographic characteristics between groups.

As Table 5 shows, families enrolled in the prepaid group practice are more likely to know the scope of outpatient services provided to them than are families with reimbursement insurance. Families with reimbursement insurance whose policies specify an initial deductible for outpatient medical care are less likely to report they are covered for physician and drug use than families who have first-dollar benefits for these services.

There are two competing hypotheses to explain why families whose policies include a deductible for outpatient medical services are less likely to report that they are covered for the service. First, underreporting may reflect a true lack of knowledge. Families with deductibles would not receive reimbursement for normal use of outpatient services, because their expenditures would be too small to satisfy

[6]We would find some underreporting of hospital coverage if all families were included in the analysis, because we found that having insurance was underreported.

[7]For example, see National Center for Health Statistics (1966) and Phelps (1974).

TABLE 5

Percent of Insured Families Correctly Reporting Coverage of Specified Services

	Percent Correct by Type of Coverage for Service				Number of Cases			
	GHC (A)	First-Dollar (B)	Initial Deductible (C)	Not Covered (D)	A	B	C	D
Hospital	100	98	98	—	142	860	97	—
Outpatient								
Physician	92	87	61	40	142	178	686	93
Drug	89	76	47	73	142	34	865	58
Dental	—	72	89	82	—	179	40	862[2]

[1]Percents adjusted for differences between groups in demographic characteristics. See text for explanation.
[2]Eighteen families with dental insurance are excluded from the sample because details on the type of coverage were unavailable.

TABLE 6

Regression of Knowledge of Service Coverage on Family Characteristics Probability of Correctly Reporting Whether the Service is Covered[1] (Regression Coefficients × 100)

Service	Independent Variables				
	Choice	Prior Use	Race	Ln Income	Ed Head
Hospital	−1.1	0.5	−6.5*	0.1	0.2*
Outpatient Physician	5.5	1.0	−15.7*	−0.1	1.7*
Drug	2.5	3.4	−24.1*	6.7*	0.6
Dental	5.6*	0.3	−2.8	1.9	−0.3

*P<.05
[1]Dependent variable is 0.1; 1 if correctly reported that service was covered in baseline interview. Coefficients on indicator variables for type of insurance are given in Table 5. Definitions for variables are in the Methods section.

their deductible. Because they are not normally reimbursed for outpatient care, they may not be aware that the plan includes outpatient benefits.

An alternative hypothesis, however, is that it is not lack of knowledge, but the way in which questions are asked, that results in the underreporting. The standard questioning method is to ask whether the plan would pay benefits for the outpatient service. A family's negative response to this question might reflect the expectation that its outpatient expenditures will not be large enough to satisfy the deductible, rather than lack of knowledge about the services covered.

To explore the competing hypotheses, the questioning method was experimentally varied in the baseline interview.

Lack of Knowledge Vs. Question Methods Effects

The baseline interview used two methods of questioning families about whether or not each of the services was covered by their insurance policy. One technique, used for a random one-half of the sample, asked whether the plan paid benefits for each service. The questions were similar to those used in previous studies. The other technique added a follow-up probe about whether or not the plan would provide benefits if the family's expenditures were sufficiently high. The second method was designed to distinguish between families who believed that the plan would not reimburse them for their expenditures because of the deductible, and families who believed that the service was not at all covered.

Among families whose policies include deductibles, the probe method of questioning used in the baseline interview elicited a higher proportion of correct responses about coverage of outpatient services than the standard single question approach (Table 7). However, the effect of the questioning method is not enough to explain the lower level of awareness among families with deductibles. Under the follow-up method, only 65 percent of families with deductibles for outpatient physician care reported that the service was covered, compared with 87 percent of families with first-dollar coverage for physician visits. Similarly, only 50 percent of families who had deductibles for drug benefits reported coverage, compared with 78 percent of families who had first-dollar coverage for drug benefits. These are significant differences.

We conclude that the standard single question approach does contribute to the underreporting of outpatient medical coverage by families whose policies include deductibles. Most of the underreporting, however, appears to be a true lack of knowledge that outpatient medical services are covered.

TABLE 7

Percent of Families with Initial Deductible for a Service Correctly Reporting Coverage of the Service[1]

Service	Percent Correct by Type Question Method		Number of Cases	
	Single Question	Follow-up Method	Single Question	Follow-up Method
Hospital	98	98	42	55
Outpatient Physician	57	64*	276	410
Drug	42	50*	379	486
Dental	87	93	26	14

*Significantly different, P<.05.
[1]Percents adjusted for difference between groups in demographic characteristics. See text for explanation.

Knowledge of Amount of Insurance Benefits

This section describes consumers' knowledge of the amount of their insurance benefits and investigates whether simplifying the benefit structure and educating consumers could be effective in upgrading knowledge. We find that accuracy increases when insurance benefits are uniform and include only a few plan parameters. Plans that include a combination of deductibles, coinsurance rates, and/or fee schedules are less likely to be understood than plans that pay in full, or are subject only to a deductible. Families whose plan specifies one coinsurance rate that applies to all services can better describe their benefits for a variety of services than families whose plan has different coinsurance rates for different services.

Knowledge levels increase as exposure to information increases, suggesting that consumer education efforts could be helpful. Higher knowledge scores among the experimental families who received both in-person and simple written explanations of their benefits, than among the control families, also indicate that consumer education may be effective.

The data presented in this section are from the self-administered questionnaire. Families' answers about how much they would pay out of pocket for hypothetical medical bills are compared with the information coded from policy brochures. To investigate factors that affect knowledge, we assign families either a zero or one score for each of the 10 hypothetical bills. A score of one is given if a family's reported share of the hypothetical bill was within 10 percentage points of the true share; a score of zero is given otherwise. These scores are regressed on indicators for the type of insurance and other family characteristics.

This section is organized in four parts: In the first part, we describe the existing level of knowledge by looking at the knowledge scores for control families with reimbursement insurance. We also investigate factors that explain differences in knowledge across families. In the second part, we further investigate factors that affect knowledge by analyzing the knowledge scores for experimental families. We then compare knowledge among the experimental families with knowledge among the control families. We conclude by investigating knowledge among families in the prepaid group practice and comparing their scores with those of families holding reimbursement insurance.

Knowledge Among Control Families with Reimbursement Insurance

The control families' estimates of what they would pay out of pocket for 10 medical and dental bills were in close accord with what their insurance policies specified. Table 8 shows the share (in percentages) that control families with reimbursement insurance reported they would pay out of pocket, the actual share as determined from information in policy brochures, and the difference between the reported and actual share. The means are the average for all families who gave an answer to the specific question. The last column in Table 8 shows that about 95 percent of families provided answers to questions about hospital, physician, drug, and dental bills. Families were more uncertain about their plan benefits for psychiatric care, as shown by the higher percentage of respondents not answering questions about psychiatric bills.

TABLE 8

Mean Perceived and Actual Own Share of Ten Medical and Dental Bills, Control Families with Reimbursement Insurance

	Perceived Share (Percent)	Actual Share (Percent)	Difference	Percent not giving answer
Own Share of Initial Bill				
$100 Hospital	16.6	7.3	9.3 (1.6)	5
$ 10 Doctor	80.7	88.1	−7.4 (1.6)	4
$ 10 Prescription	81.6	89.2	−7.5 (1.7)	5
$100 Psychiatric	73.6	83.7	−10.1 (2.7)	10
$ 10 Dental	87.8	88.6	−0.8 (1.6)	4
Own Share After $4,000 Hospital Bill				
$100 Hospital	13.6	9.1	4.5 (2.0)	7
$ 10 Doctor	74.9	79.1	−4.1 (2.2)	6
$ 10 Prescription	78.0	80.9	−2.9 (2.2)	6
$100 Psychiatric	70.3	81.2	−10.9 (2.8)	11
$ 10 Dental	91.3	87.6	3.8 (1.6)	5

NOTE: Standard errors in parentheses.

Although the answers that families gave about how much they would pay for the hypothetical bills differ by a statistically significant amount from the correct answers, the differences are small; families' reports of their own shares of the bills differ by less than 10 percentage points, on average, from the true answer. This suggests that decisions about the use of health services may be based on reasonably accurate judgments about out-of-pocket costs. However, the finding does not necessarily mean that families are knowledgeable about the details of their insurance policies, particularly concerning outpatient care. For most families, the "correct" answer to the hypothetical questions about outpatient expenditures was that they would pay the full share. And most families reported that they would pay the full share. As discussed in the previous section, how-

ever, this response may be based on the incorrect belief that a service is not covered, rather than on accurate information about deductibles for outpatient care.[8]

To better assess how much families know about the details of plan benefits, we look at whether or not families who would receive some reimbursement for the expenditure (according to the record) are able to report their own share of the bill correctly. Table 9 gives the (adjusted) percent of families who correctly reported their out-of-pocket payment for each of the hypothetical bills according to whether the insurance policy would pay the full share of the hypothetical bill, part share of the hypothetical bill, covers the service but would not reimburse for the hypothetical bill, or does not cover the service. The classification depends on how much the plan will pay for each hypothetical bill and so may vary from service to service for any one insurance plan. The adjusted percentages shown in the table are regression coefficients (multiplied by 100) on indicator variables for the share that the plan would pay, obtained by fitting a linear probability function to the binary scores each family was assigned.[9]

Families were more likely to give a correct response if they were responsible for the full share of the bill than if their insurance would pay some or all of the hypothetical expenditure. This result, however, included some families who were right for the wrong reason, that is, families who believed, incorrectly, that the service was not covered.

Lower knowledge scores about benefits for outpatient expenditures incurred subsequent to a hospital bill than about benefits for initial outpatient expenditures are also partly because many families incorrectly believe that they are not covered for outpatient care. Most families with outpatient coverage are required to satisfy a deductible and therefore would be required to pay the full share of an initial expenditure. Out-of-pocket payments for a $4,000 hospital bill would satisfy the deductible for about 10 percent of the families and these families would then be reimbursed for subsequent outpatient expenditures. That is, more families would receive some reimbursement for the outpatient expenditure subsequent to a hospital bill than for the initial bill. Thus, fewer families who incorrectly believe they are not covered for outpatient care will give an apparent correct response about the outpatient expenditure incurred after a hospital bill. Hence, knowledge levels about this bill are lower than knowledge about initial outpatient expenditures.

A comparison of knowledge among families who receive full reimbursement for an expenditure, and those who receive only a partial reimbursement, shows that knowledge is affected by plan complexity. The comparison allows us to examine the effects of the amount of information the family has to know and use, to correctly answer the question we posed. If the plan pays the full share of the family's first-dollar (initial) expenditure for a service, the only information the family needs is that the service is fully covered; there are no deductibles, coinsurance rates, or binding fee schedules for the family to think about in answering the question about that service. For the set of hypothetical bills subsequent to a large hospital expenditure, a plan that reimburses 100 percent may include a deductible, but again there are no coinsurance rates or fee-schedules applicable to the expenditure. On the other hand, a plan that reimburses in part may include a combination of deductibles, coinsurance rates, and fee-schedules that the family must know about in order to give a correct answer to the question. Thus, a plan that pays only a partial share of the bill has a more complex benefit structure, at least in relation to the hypothetical expenditure, than a plan that reimburses in full.

Simplicity of plan is strongly related to the probability that the family is knowledgeable about the benefits. Seventy-five percent of families correctly answered questions about their out-of-pocket payments for hospital care, if the plan would pay in full. However, the probability of correctly answering falls by one-half if the plan is more complex, that is, if it would reimburse only part of the expenditure (Table 9). More than 50 percent of the families who would receive full reimbursement for physician and drug expenditures after an initial $4,000 hospital bill correctly reported their benefits for these hypothetical expenditures. Again, however, knowledge falls by one-half for more complex policies.[10] Knowledge of dental and psychiatric benefits is slightly lower than knowledge of the other services. However, the relationship between complexity and knowledge is also evident for three of the four hypothetical psychiatric and dental expenditures.

In addition to complexity of plan, there are two other factors that we expect to affect knowledge. First, families must be exposed to the information. Second, once exposed, the family members must be able to assimilate the information, retain it, and apply it in making calculations about health services expenditures. To determine whether these factors do affect knowledge, we included proxy measures for exposure and ability as additional independent variables in fitting the linear regression for the probability of a correct answer. The regression coefficients for the exposure and ability measures are given in Table 10. (Formal definitions of the independent variables are given in the Methods section.)

Families who were offered a choice of insurance plans by their employer group, or who chose to purchase private supplementary insurance, were more likely to have had detailed exposure to information about their insurance, in order to make a choice, than families who did not have a choice. Choice does increase consumers' knowledge, particularly about the more complicated hypothetical bills that involved an initial $4,000 hospital expenditure.

[8]Most families with outpatient coverage are required to satisfy a deductible. Our intention was to measure knowledge of coverage, once the deductible was satisfied, by including the questions about outpatient bills after incurring the large hospital bill. However, most families also have full coverage for hospital care, and so the large hospital expenditure does not satisfy their deductible.

[9]The coefficients on the other variables in the regression are shown in Table 10.

[10]Knowledge scores shown for physician and drug expenditures combine families who would receive full reimbursement and families who would receive partial reimbursement; fewer than 10 families would receive only a partial reimbursement for the initial expenditures.

TABLE 9

Percent of Control Families Reimbursement Insurance Correctly Reporting Out-of-Pocket Payments for Medical Bills

	Percent Correct by Share Plan Pays For Expenditure					Sample Sizes			
	100% (a)		Part (B)	0% (C)	Not Covered (D)	A	B	C	D
Initial Expenditure									
$100 Hospital	75		36	72	—	332	59	6	—
$ 10 Doctor	—	73	—	84	88	44	4	327	22
$ 10 Drug	—	64	—	81	83	36	8	332	21
$100 Psychiatric	49		51	54	57	56	33	204	104
$ 10 Dental	51		21	84	91	34	11	22	303
Expenditure after $4,000 Hospital Bill									
$100 Hospital	74		37	0[2]	—	316	55	26	—
$ 10 Doctor	59		24	77	82	56	31	288	22
$ 10 Drug	54		25	78	79	44	38	294	21
$100 Psychiatric	32		23	56	54	56	58	179	104
$ 10 Dental	40		5	91	92	34	17	16	303

[1]Percentages adjusted for differences between groups in other characteristics. See text for explanation. An answer is considered to be correct if the percentage the family reports it would pay is within 10 percentage points of the actual share.

[2]The families who receive no reimbursement for the $100 hospital bill, after incurring a previous $4,000 bill, have exceeded plan maximums. Apparently families do not have knowledge of these limits.

TABLE 10

Relationship of Ability and Exposure Measures to Probability that Control Families Correctly Report Their Benefits (Regression Coefficients × 100)

	Independent Variables						
	Choice	Dayton[1]	Covered 2-5 Yr.	Covered 5+ Yr.	Use	Ed. Head (years)	Psychiatric Same
Initial Expenditure							
$100 Hospital	7.1	7.6	3.7	9.1*	5.1	1.4**	—
$ 10 Doctor	3.3	9.9*	4.5	7.9*	3.0**	0.3	—
$ 10 Drug	5.0	3.3	−1.9	6.8	1.0	1.2**	—
$100 Psychiatric	−1.1	12.8*	−1.1	12.0*	−1.5	0.4	43.7**
$ 10 Dental	9.3*	1.9	−1.7	1.9	—	2.1**	—
Expenditure After $4,000 Hospital Bill							
$100 Hospital	12.6**	13.5**	6.0	11.3**	3.3	1.2**	—
$ 10 Doctor	11.5**	12.6**	0.7	19.1**	3.1**	0.5	—
$ 10 Drug	9.6*	8.7	−4.4	11.4**	0.8	0.9*	—
$100 Psychiatric	0.1	15.2**	11.7	9.7*	−1.9	0.7	16.9**
$ 10 Dental	6.1*	4.1	5.5	—	−0.2	1.6**	—

*P<.10

**P<.05

[1]The choice variable is missing for the Dayton sample; this is a dummy variable which takes the value 1 if in the Dayton sample and reflects the average effect of choice for the Dayton respondents.

The longer a family has held its insurance policy the more knowledge they are likely to have. On the other hand, the longer they have held the policy, the more distant they are from the choice of insurance plan and any information gathered to make a choice. We find, however, that knowledge increases with time. Families who had their policies for more than 5 years have a significantly higher probability of correctly reporting their benefits than families who had them only 1 or 2 years (the omitted classification).

We expected that families who had extensive prior use of medical services would have had more recent exposure to their benefits than other families, and hence be more knowledgeable. Nevertheless, prior use is significantly related only to knowledge of physician service benefits.[11]

The education of the family head is a proxy for ability to understand and use the information about insurance benefits. It is significantly related to a family's knowledge of its benefits. In regressions not reported, we also included race and family income as independent variables. On theoretical grounds these are not as good proxy measures for either ability or exposure as the other variables, and, in fact, neither race nor income was significant after controlling for the variables shown.

The "psychiatric same" variable, used to explain knowledge of psychiatric benefits, is a measure of plan complexity. It is a dummy variable that takes the value 1 if the plan would pay the same share of both the hypothetical psychiatric bill and the other physician bill. A value of 1 indicates uniformity of benefits for these two services and so reflects a simple benefit structure. As expected, if psychiatric coverage is the same as coverage for other physician services, families are much more apt to know their psychiatric benefits.

In sum, the three concepts of complexity of benefit structure, exposure to the information, and ability to understand are all significantly related to families' knowledge of their insurance. The significance of the exposure variables suggests that consumer education efforts could be effective in improving knowledge. The knowledge differences found between families whose plans reimbursed in full and those whose plans paid only a part share of the bill, suggests that simplifying benefit structures would also improve knowledge. For more evidence on how the complexity of the benefit structure affects consumer knowledge, we turn to an analysis of the responses of families in the experimental plans.

Knowledge among Experimental Families with Reimbursement Insurance

Families participating in the experimental phase of the Health Insurance Study are assigned to one of 14 different insurance plans that vary in the share of the bill the family has to pay for medical expenditures. For our purposes, the plans can be grouped into four categories of increasing complexity. One plan provides free care to the family. Nine plans include a single coinsurance rate that applies to all services—either 25 percent, 50 percent, or 95 percent. These nine plans with single coinsurance rates have ceilings on annual out-of-pocket expenditures that vary with family income to a maximum of $1,000. Above the limit, all care is free. Three plans have a 50-percent coinsurance for dental and outpatient mental services and a 25 percent coinsurance for other services, the 25-50 plan. These plans also have an annual income-related maximum on out-of-pocket expenditures. One plan, the ID plan, has a 95-percent coinsurance for outpatient services, but hospital care is fully covered. The ID plan includes a $150 annual out-of-pocket limit per individual (up to $450 per family) for non-hospital services.

Families with free coverage, or with a single coinsurance rate applicable to all services, are more likely to know how much they would pay for the initial medical and dental bills than families on the other two plans (Table 11). Uniformity of benefits across services apparently leads to increased consumer knowledge.

TABLE 11

Percent of Experimental Families Correctly Reporting Out-of-Pocket Payments for Medical Bills[1]

	Free Plan	Single Coinsurance Plans	25-50 Plan	ID Plan %
Initial Expenditure				
$100 Hospital	87	81*	84	66*
$ 10 Doctor	86	84	74*	81*
$ 10 Drug	85	82	74*	69*
$100				
Psychiatric	81	81	67*	61*
$ 10 Dental	85	83	82	80*
Expenditures After $4,000 Hospital Bill				
$100 Hospital	87	74*	67*	83
$ 10 Doctor	86	72*	66*	43*
$ 10 Drug	85	75*	69*	45*
$100				
Psychiatric	83	71*	64*	37*
$ 10 Dental	84	71*	65*	46*

*Significantly different from free plan, $P<.05$.
[1]Coefficients on plan indicator variables in a linear probability function. See text.

The hypothetical hospital bill of $4,000 was chosen to satisfy the annual out-of-pocket limit for families in all plans but the ID plan; hospital care is free in the ID plan. To answer the second five hypothetical questions, about expenditures after a $4,000 hospital bill, families in the free plan need know only that all care is fully covered. In the other plans, however, families must know the correct coinsurance for initial care, be able to calculate how much their out-of-pocket payment would be, determine if it exceeds their plan maximum, and know that care is free above the

[11]However, prior use is measured as utilization in the year prior to the baseline interview. There were varying lapses in time between the baseline interview and the administration of the questions concerning extent of benefits (see Methods section). For some families, our measure of prior use may be several years before they were asked to complete the mailed questionnaire.

maximum. They have to know about all provisions of the plan. In view of the earlier evidence, it is not surprising to find that knowledge of their own share, after a $4,000 hospital bill, falls as the number of parameters in the plan increases (Table 11).

Proxy measures for the other concepts, ability and exposure, are also significantly related to the probability that experimental families correctly describe their benefits (Table 12). Ability, as represented by the education of the family head, is consistently positive and significant. In regressions not reported, we also tested whether or not education has a stronger effect on knowledge if the plan benefits are complex than if the benefits are simple. We did not find consistent support for the hypothesis that knowledge differences among families with different levels of education increase as plan complexity increases. The interaction of education and type of experimental plan was not significant in explaining knowledge about out-of-pocket costs for initial expenditures, nor were the signs of the coefficients consistent with the hypothesis. Education had a stronger (though not significantly different) effect among families with single coinsurance plans than with families with free plans on knowledge about out-of-pocket costs for expenditures incurred after a $4,000 hospital bill. Increased education was significantly more likely to improve knowledge about the large expenditures among families in the 25-50 plan than among families in the free plan or single coinsurance plans. The trend, though, did not hold for families in the ID plan. The education coefficient for families in the ID plan was smaller in the regressions for all 5 of the large medical bills, though not significantly different, than the coefficient for families in the free plan.

Prior use is not a direct measure of exposure to the experimental plan benefits, because it reflects utilization in the year before the family enrolled in the experiment. However, to the extent that families with high utilization prior to enrollment in the experiment also have high utilization after they have enrolled, this variable will represent exposure to experimental plan benefits through postenrollment utilization.[12] Because prior use is, at best, an imperfect proxy for utilization under the experimental plan, race and income, which also correlate with utilization, are included as independent variables. Race and income are both significantly related to knowledge.

Blacks and low income families are known to have used fewer medical services during the first years of the experiment than whites and high income families (Newhouse *et al.*, 1981). Hence, lower knowledge among these families may be due to less experience with the insurance plan, giving support to the hypothesis that families learn about their benefits by using the medical care system. However, an alternative hypothesis is that the lower knowledge among black and low income families inhibited their use. If lack of knowledge has led to reduced use of services among black and low income families, we would expect these families to overestimate their out-of-pocket costs. If black and low income families have more variable errors, but do not systematically overestimate their own costs, however, this would support the hypothesis that these families have not learned about the benefits available to them because they have had less medical care.

To explore whether knowledge of benefits affects medical use or whether knowledge is gained through experience with the medical care system, we regressed race, income, and the share of the bill the family would pay, on the size of the error families made in estimating their own cost of each initial hypothetical expenditure.

The regression results are shown in Table 13. The results do not definitely support either hypothesis. The income elasticity of the demand for medical care has been found to be positive (Newhouse *et al.*, forthcoming), though significantly different from zero only in the Dayton site. If lack of knowledge has inhibited use among low income families, we would expect a negative relationship between income and the magnitude of the knowledge errors. Nevertheless, we find a positive, though not significant, income coefficient. This tends to support the hypothesis that lower use has resulted in lower knowledge. Conversely, blacks, who use less medical care than whites, do estimate higher out-of-pocket costs of care than whites, supporting the alternative hypothesis that lower knowledge has inhibited use.

We can indirectly test whether families find out about their insurance benefits through use of services by examining variations in knowledge scores by type of service (Table 11). If use promotes knowledge, we would expect families to be more familiar with the services they use frequently, such as doctor and dental care, than with hospital or psychiatric benefits that are used by only a small percentage of families. A competing hypothesis is that families are risk averse and will inform themselves about how their insurance covers services with expected high costs. In this case, we would predict that families would know about their hospital benefits which have a high expected cost, even though families have only a small probability of using hospital care; they would be expected to know less about coverage for services such as prescription drugs which have a low expected cost. The difference in knowledge between types of services suggests that both factors may be at work. Knowledge about psychiatric services is consistently lower than knowledge of other benefits, suggesting that families are not familiar with services they do not use. On the other hand, families tend to be as well informed about hospital care as about other more frequently used services, suggesting that families are concerned about their coverage for high-cost events.

With the data presently available, we have been unable to provide definitive evidence to support or refute the hypothesis that families learn about their insurance benefits as they use medical care. But, the data collection design of the Health Insurance Study provides for measuring families' knowledge of their experimental insurance coverage several times during their participation in the experiment. With subsequent data, we will be able to explore whether families who have used services intensively show greater gains in knowledge than families who have little use of services. Future analyses should yield better evidence about the relationship between medical use and knowledge of insurance.

[12]Evidence on the size of this relationship is in Duan *et al.*, 1982.

TABLE 12

Relationship of Ability and Exposure Measures to Probability that Experimental Families Correctly Report their Benefits

	Independent Variables							
	Ed. Head (years)	Prior Use	Race	Ln In-come	Sites SC[1]	Seattle	MA	Dayton
Initial Expenditure								
$100 Hospital	0.7*	1.7	−17.2*	4.0*	−2.9	−2.7	4.1	−4.3
$ 10 Doctor	1.1*	0.9	−15.7*	3.5*	−2.8	4.2	5.9	−3.2
$ 10 Drug	0.8*	0.6	−14.9*	3.6*	−3.2	6.4	3.9	−1.8
$100 Psychiatric	0.4	0.4	−14.0*	3.8*	2.6	5.9	6.8	0.5
$ 10 Dental	1.0*	0.7	−14.9*	3.6*	−1.1	5.5	7.9	−2.9
Expenditure After								
$100 Hospital	1.0*	1.7	−25.6*	2.0	−1.7	5.8	7.8*	1.0
$ 10 Doctor	1.1*	0.8	−16.8*	1.7	2.9	7.0	0.0*	3.0
$ 10 Drug	1.1*	0.0	−15.8*	1.4	2.5	7.0	0.5*	3.9
$100 Psychiatric	1.0*	0.5	−15.9*	1.3	1.4	4.7	7.1	−0.9
$ 10 Dental	1.2*	0.7	−13.6*	1.4	2.8	6.1	8.9*	0.9

* P<.05

[1]Two-thirds of the South Carolina sample received the questionnaire at enrollment while one-third of the South Carolina sample received the questionnaire several months after enrollment. The indicator in the regression takes the value 1 for that part of the sample receiving the questionnaire at enrollment. The omitted group is the rest of the South Carolina sample.

TABLE 13

Regression of Race, Income, and Actual Coinsurance Rate on Errors in Estimating Own Share of Initial Medical Bill, Experimental Families

	Independent Variables					
		Ln	Actual	Coinsurance Rate		
Source	Race	Income	0	25	50	95
Hospital	6.0*	0.7	15.2*	2.0	−0.3	−16.8*
Physician	6.6*	1.5	11.1*	5.6*	2.8	−13.5
Prescription	9.2*	1.6	11.2*	5.5*	1.3	−20.3*
Psychiatric	−0.3	2.3*	11.7*	3.9	−4.5	−22.2*
Dental	4.2*	1.7*	13.1*	5.9*	0.4	−13.2*

*P<.05

Indicator variables for the sites are included in the regression (Table 12) because the length of time that the families were enrolled before completing the questionnaire varies among the sites. Table 14 shows how long families in each site had been enrolled prior to completing the post-enrollment questionnaire. In addition to differences in the length of time families had been covered by the insurance, individual sites also had different staff involved in enrolling families. Thus, if differences between sites were found, they might reflect a variety of factors in addition to length of participation, such as the quality of the enrollment or explanation of benefits. However, site effects are generally small, suggesting that any learning effects in sites with more experience, such as Dayton, were largely offset by other factors.

TABLE 14

Length of Time on Experimental Plan

Site	Range	Mean
Dayton	27-34 months	29 months
Seattle	5-17 months	9 months
Massachusetts	2-10 months	4 months
S. Carolina	1- 7 months[1]	4 months
S. Carolina	At enrollment[2]	

[1]One-third of the sample in S. Carolina.
[2]Two-thirds of the sample in S. Carolina.

Comparison of Knowledge Among Experimental and Control Families

Although the benefits of experimental plans vary in degree of complexity, all of the experimental plans are more readily understood than typical health insurance policies; there are no internal limits, no major exclusions and exceptions, and nearly all health services are covered. Prior to enrollment in the study, families were provided simple, written documents explaining their benefits and were given in-person explanations of the plan. Therefore, we expected that experimental families would exhibit more knowledge about their plans than control families. The data in Table 15 confirm this expectation.

The entries in Table 15 show the difference between the probability that a family in a given experimental plan correctly reports its own share of a medical bill and the probability that a control family with similar characteristics reports its share correctly. The two linear probability functions, one for control families and one for experimental families, described earlier in this section, were used to estimate the probabilities. The predictions were made by using the sample mean of family characteristics. For control families, the prediction is for a family that has held its insurance coverage for less than 2 years; this comparison allows us to adjust for a common learning time between experimental and control families.

Almost all of the differences in Table 15 are positive, indicating that families in all the experimental plans are more knowledgeable about their benefits than control families. This supports the notion that simple benefit structures, clearly written materials, and consumer education efforts could help families to understand their insurance. Comparing knowledge scores for control families whose policies reimburse for the service in full with knowledge among experimental families, we find that experimental families are more familiar with their benefits. This suggests that educating experimental families had positive effects. A typical insurance policy that reimburses one service in full may contain exclusions, restrictions, and different payment rates for other services. That is, simplicity of the benefit structure for one service may not adequately capture the overall degree of the complexity of the plan. Consequently, we cannot assert with certainty that education has had an effect over and above the fairly simple benefit structure in the experimental policies. Further, people may behave differently simply because they are enrolled in an experiment (the so-called Hawthorne effect). To the extent, if any, that experimental participation has encouraged families to become familiar with their insurance benefits, comparison of knowledge levels between experimental and control families overstate the benefits of simple insurance policies and consumer education.

Knowledge Scores among Persons in a Prepaid Group Practice

Many recent health initiatives have focused on alternatives to the fee-for-service delivery system. In this section, we compare knowledge about insurance benefits among families in a prepaid group practice with knowledge levels among families in the fee-for-service system.

TABLE 15

Difference Between Knowledge Scores of Experimental and Control Families[1]

	Control Families with 100% Coverage Compared to:				Control Families with Part Coverage Compared to:			
	Free Plans	Coinsurance Plans	25-50 Plan	ID Plan	Free Plan	Coinsurance Plan	25-50 Plan	ID Plan
Initial Expenditure								
$100 Hospital	17*	11*	14*	−4	56*	50*	53*	35*
$ 10 Doctor	18*	16	6	12	—	—	—	
$ 10 Drug	24*	21*	13	7	—	—	—	—
$100 Psychiatric	40*	40*	26*	20*	37*	37*	23*	17
$ 10 Dental	33*	31*	30*	28*	64*	62*	61*	59*
Expenditure After $4,000 Hospital Bill								
$100 Hospital	20*	7	1	17*	57*	44*	38*	54*
$ 10 Doctor	36*	23*	17*	−6	71*	58*	51*	29*
$ 10 Drug	35*	21*	16*	−8	64*	50*	44*	20*
$100 Psychiatric	58*	46*	39*	12	67*	55*	48*	22*
$ 10 Dental	44*	31*	25*	6	80*	67*	61*	42*

*Significant $P<.05$.

[1]Predicted difference between probability that an experimental family gives a correct answer and probability for a control family with similar characteristics who has had coverage less than two years. Probabilities have been multiplied by 100.

Families in the prepaid group receive all of their medical care free at the time of use.[13] About 85 percent of the families in the prepaid group, experimental and control, understood that a variety of services are free to them. This compares favorably with the knowledge exhibited by families who have full reimbursement insurance. Table 16 compares the probability of a correct response about the medical bills among control families in the prepaid group, and experimental families in the free plan. The predicted probability shown for a control family in the prepaid group is made for a length of participation of less than 2 years. Experimental families in both the prepaid group and the free plan were enrolled for about 9 months. Only families enrolled in the free plan in Seattle are included in Table 16, so that the comparison of the two groups of experimental families will not reflect any differences between sites in the enrollment process. The coefficients in Table 16 are from fitting a linear probability function to control for differences between groups in other characteristics. The other coefficients are in Table 17. For this analysis, the other variables are measured as deviations from the mean values for the total Seattle sample rather than the mean values across all sites.

TABLE 16

Comparison of Knowledge Scores for Families in Group Health and with Full Reimbursement Insurance[1]

	Group Health Control	Group Health Experimental	Free Plan (Seattle)
Initial Visits			
Hospital	90	83	91
Physician	90	84	92
Prescription	89	84	88
Psychiatric	84	84	84
Repeat Visits			
Hospital	90	83	90
Physician	88	83	91
Prescription	90	83	88
Psychiatric	88	84	83

[1]Coefficients on plan indicator variables in a linear probability function, see text. Knowledge of dental benefits is not shown because at this time Group Health does not provide dental benefits.

None of the differences among the groups in Table 16 are significant. There is a tendency for fewer experimental families in the prepaid group to report their benefits correctly than control families. However, differences are small and probably reflect the fact that experimental families had been participating less than a year. The overall high knowledge levels among the three groups suggest that if benefits are simple enough, families will understand their insurance.

[13]For the control families in the prepaid group, there is a copayment for psychiatric visits after the 10th visit that ranges from $5 to $8.

Conclusions

Do families know if they have health insurance? Our data show that more than 90 percent of families accurately report whether or not they are insured. But there is a small underreporting of having insurance.

Do families know what services are covered by their insurance? We find that most insured families correctly report having coverage for hospital care, but that they know less about which outpatient services are covered. About 80 percent of families who have first-dollar coverage for outpatient medical services (physician and drug) know that they are covered. However, if the policy requires that the family satisfy a deductible before receiving benefits for these services, only 50 to 60 percent of families are aware that the services are covered.

Incorrect reporting of having outpatient coverage among families whose policies include a deductible may, in part, reflect the family's expectation that it will not receive reimbursement, rather than lack of knowledge that the service is covered. Survey questions that probe about deductibles did result in fewer false negative responses among families whose policies include a deductible than did standard questions. Additional work on question wording might reduce even further the discrepancies between families' reports of having coverage and the verification data. Nevertheless, the conclusion that many families lack knowledge that outpatient medical services are covered is not likely to be altered by more attention to question validity.

Do families know what benefits the plan will pay for covered services? Knowledge of the amount of benefits for covered services varies with the complexity of the benefit structure. Seventy-five percent of control families were able to report how much they would pay for hypothetical hospital expenditures, if the plan would reimburse in full. More than half of the families who would be reimbursed in full for physician or drug expenditures were able to correctly answer questions about their benefits for these services. However, if the plan includes coinsurance or fee-schedules, only half as many families can describe their benefits.

The relationship between plan complexity and consumer knowledge was also found among the experimental families. Families in experimental plans with free care, or with a single coinsurance rate that applies to all services, have higher knowledge scores than families in plans with different coinsurance rates for various services. We conclude that simplifying benefit structures would improve consumers' knowledge about their insurance.

There is also evidence that consumer education could be effective in improving knowledge about benefits. We find that exposure to information about the insurance plan increases knowledge. Further, we find that families enrolled in the experimental plans had a better understanding of their benefits than families not in the experiment. We had

TABLE 17

Relationship of Ability and Exposure Measures to Probability of Correctly Reporting Benefits: Group Health Families and Seattle Families in Free Experimental Plan[1] (Regression Coefficients × 100)

Service	Independent Variables					
	Covered[2] 2-5 Yr.	Covered[2] 5+ Yr.	Prior Use	Race	Ln Income	Ed Head
Initial Visit						
Hospital	−1.2	−0.3	0.2	−24.1*	2.5	0.5
Physician	0.1	0.9	−0.4	−18.9*	2.1	0.7
Prescription	1.7	1.7	−0.1	−28.7*	1.8	0.6
Psychiatric	5.2	6.9	−0.9	−20.1*	2.5	0.6
Repeat Visits						
Hospital	−0.1	1.0	0.3	−24.3*	2.1	0.7
Physician	1.4	2.5	0.0	−24.4*	2.3	1.0*
Prescription	0.1	0.0	−0.1	−29.2*	2.7	1.0
Psychiatric	0.6	−0.1	−0.9	−15.5*	2.5	0.5

*P<.05

[1]Dependent variable is 0,1; 1 if the out-of-pocket payment was correctly reported. Coefficients on indicator variables for the type of insurance coverage are given in Table 16. Definitions for variables are given in the methods section.

[2]Length of time on plan if a control Group Health family.

attempted to educate families in the experimental plans by providing simple written documents and giving them in-person explanations of their benefits.

What are the policy implications of our results? We noted in the introduction that the case for market competition for allocating medical care resources assumes a well-informed consumer; the case for regulation assumes that consumers do not have sufficient information to make economic choices about their medical care treatment. Our results do not support either extreme view of consumers' knowledge about their health insurance: most families are informed about some aspects of their insurance coverage, but many lack knowledge of details of the benefits. Our results suggest that if competitive approaches are adopted, policymakers may want to encourage efforts at improving knowledge by simplifying benefit structures and through consumer education.

Our focus in this report was to describe consumers' knowledge of their insurance benefits and to investigate ways in which knowledge might be improved. We have not explored in detail the effects of lack of knowledge on consumers' decisions about medical care use. We do find that black families estimate higher own costs of care than whites, and this may contribute to lower use of medical services by blacks. With additional data collected by the Health Insurance Study, we will be better able to examine how imperfect knowledge about benefits affects use of medical care and whether or not use of medical care results in improved knowledge of benefits. The Health Insurance Study measures experimental families' knowledge about their insurance several times during their participation in the experiment and collects information on their use of medical services before and after each knowledge measurement. With these additional data, we will address such questions as: Does lack of knowledge that a service is covered inhibit families from using the service? How does lack of knowledge about the extent of benefits affect the amount of care used? Do families who use services extensively show greater knowledge gains than families who use fewer services?

Acknowledgments

I would like to thank David Kanouse, Arleen Lebowitz, Joseph Newhouse, and John Ware, Jr., for their helpful comments on an earlier version of this paper, and Nancy Lee for valuable programming assistance.

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